

IC7.1: Optional Job sheet

Monitoring Model Accuracy

Objective: Examine model data from a winter weather case to assess the pitfalls of numerical weather prediction as discussed in the winter weather AWOC IC 7 Lesson 1 training module.

Data: 15 March 2004 winter weather event across the Midwest. You will be using AWIPS D2D for this exercise.

Instructions:

- Load the 15Mar2004 Winter Weather AWOC case on your WES machine in case review mode, using the DMX localization. Set clock to 13 UTC 15 March 2004. You will be examining the **12 UTC NAM Analysis** from 15 March 2004 unless otherwise noted.

Assessing Pitfall #1: Upper Trough merger, phasing

- Overlay a water vapor loop with NAM 80 500 mb absolute vorticity and heights on the CONUS scale. Monitor the progression of short-wave troughs vs. model solution, in this split flow regime.

Question 1. Are there any short wave troughs in the model output that are merging or phasing with the deep long wave trough over the Great Lakes?

Question 2. Does the NAM have the short wave trough well analyzed?

Assessing Pitfalls #2, #3 and #7: Surface cyclone intensity and track, convection/diabatic effects

- Load and examine hourly obs and MSLP objective analyses (MSAS) with IR satellite over the last 24 hours (13 Z 14 March through 13 Z 15 March) on the regional scale. Overlay NAM 40 MSLP and 1-hour lightning. You are looking for unexpected lightning strikes and IR showing significant cloud top cooling near the surface low, or significant departures in the current data from the progged surface cyclone track or intensity.

Question 3. Is there any evidence that the surface cyclone is more intense or taking a different track than the models predicted? Explain your reasoning.

Question 4. Where is the convection located relative to the surface cyclone?

Question 5. How might the convection affect the surface cyclone track or intensity?

Assessing Pitfall #4: Dry slot

- Load WV imagery on the regional scale, overlay the NAM 40 700-300 mb RH fields. Focus on the 12 hr NAM forecast valid at 12 UTC and the 12 UTC WV image by selecting “Prev Run” from the top left drop down menu in D2D before you load the product in the volume browser. In another pane, load the DDC, DVN, OMA, TOP Raobs and overlay corresponding NAM 40 model soundings at those same areas (i.e. load points over those cities, then use volume browser to load point soundings)

Question 6. Where is the dry slot?

Question 7. How did the NAM 40 12 hr forecast handle the location and movement of the dry slot?

Assessing Pitfall #5: Precip transition zones

- Examine the surface obs once again on the regional scale and overlay surface temperatures from the RUC and NAM 40

Question 8. Where is the change-over to snow occurring over the last hour or two?

Question 9. How are the models handling surface conditions? Too cold? Too warm? Bad timing?

- Load a NAM 40 model sounding in the changeover region somewhere near southwest Iowa. Overlay Omaha's sounding and then overlay an aircraft sounding from around 12 UTC (MDCRS in the volume browser, you will need to have "Inventory" selected in the main D2D window before loading the aircraft data, found under upper air menu and heading "Aircraft").

Question 10. What is the primary cause of the changeover to snow?

Question 11. Will you have to worry about sleet or freezing rain anywhere across Nebraska or Iowa? Why or why not?

- Load a nearby lowest tilt radar reflectivity loop.

Question 12. Where is the radar bright banding occurring, and at what height?

6. Assessing Pitfall #6: Mesoscale banding

- Swap panes and get to the state scale. In the volume browser, load the NAM 40 model run snow accumulation product, then overlay both KDMX and KOAX 0.5 reflectivity. (You will only be able to compare a few snowfall graphics to actual radar images because of the way AWIPS loads products)

Question 13. Is the NAM accurately depicting the nature of the mesoscale snow band across Nebraska/Iowa? Be specific.

Warning Decision Training Branch

An answer key is available for this job sheet. Please see your local AWOC Winter Weather facilitator to obtain a copy.